

## Section 500—Concrete Structures

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### 500.1 General Description

General Provisions 101 through 150.

#### 500.1.01 Definitions

General Provisions 101 through 150.

#### 500.1.02 Related References

##### A. Standard Specifications

[Section 500—Concrete Structures](#)

[Section 511—Reinforcement Steel](#)

[Section 800—Coarse Aggregate](#)

[Section 801—Fine Aggregate](#)

[Section 826—Dampproofing or Waterproofing Material](#)

[Section 830—Portland Cement](#)

[Section 832—Curing Agents](#)

[Section 833—Joint Fillers and Sealers](#)

[Section 836—Special Surface Coating for Concrete](#)

[Section 853—Reinforcement and Tensioning Steel](#)

[Section 870—Paint](#)

[Section 880—Water](#)

[Section 886—Epoxy Resin Adhesives](#)

[Section 888—Waterproofing Membrane Material](#)

##### B. Referenced Documents

[GDT 35](#)

[QPL 10—Approved Ready-Mix Concrete Plants](#)

[QPL 13—Air-Entraining Admixtures](#)

[QPL 14—Chemical Admixtures for Concrete](#)

[QPL 15—Epoxy Resin Adhesives](#)

[QPL 16—Membrane Curing Compounds](#)

[QPL 17—Special Surface Coatings for Concrete](#)

[QPL 19—Bar Supports](#)

[QPL 20—Preformed Joint Fillers](#)

[QPL 22—Composite Waterproofing Membrane](#)

[QPL 23—Deck Oil for Protective Surface Treatment](#)

[QPL 66—Silicone Joint Sealants](#)

[SOP 10—Quality Assurance for Ready-Mix Concrete Plants in Georgia](#)

### 500.1.03 Submittals

#### A. Concrete Mix Designs

The [Office of Materials and Research](#) maintains mix design proportions for commonly used materials. These proportions are available for use by Approved Concrete Plants or Contractors.

The Contractor and/or the plant technician at an Approved Concrete Plant may submit specific design proportions for combinations of materials. The [Office of Materials and Research](#) will approve the proposed design proportions provided they meet the requirements of [Section 500](#) of the Specifications.

The [Office of Materials and Research](#) may require the Contractor to supply quantities of representative materials for design verification. Submit the following materials 45 days before construction.

- Cement: 400 lbs (200 kg)
- Flyash or Slag: 400 lbs (200 kg)
- Fine Aggregate: 400 lbs (200 kg)
- Coarse Aggregate: 800 lbs (400 kg)
- Admixtures: 1 qt of each (1 L)

### 500.2 Materials

Following are requirements for concrete materials:

#### A. General

Concrete must be supplied by a source that complies with [Standard Operating Procedure 10—Quality Assurance for Ready-Mix Concrete Plants in Georgia](#). The [Office of Materials and Research](#) administers this program and maintains a list of approved concrete producers on [QPL 10](#).

During periods of production for Department Projects, the [Office of Materials and Research](#) maintains sampling and testing schedules at approved concrete plants to verify acceptability of concrete materials.

#### B. Concrete Ingredients

During concrete production for Department Projects, personnel of the [Office of Materials and Research](#) will sample cement, slag, fly ash, coarse aggregate, fine aggregate, and additives each month at every active concrete plant.

Area Engineers are not required to sample and test concrete ingredients at approved plants.

##### 1. Aggregates

Aggregates are sampled according to [Section 800](#) and [Section 801](#) of the Specifications.

##### 2. Water

If the water proposed for use in concrete is fit for drinking, use it without further testing.

If the water is not fit for drinking, submit in plastic containers a 1 qt (1 L) sample from each source to the [Office of Materials and Research](#) before using it in concrete. Testing will be according to [Section 880](#) of the Specifications.

#### C. Other Materials

Other concrete-related materials, except liquid dampproofing and waterproofing, are usually pre-tested or appear on a QPL. Approved admixtures are listed in [QPL 13](#) and [QPL 14](#).

Unless these products are damaged or contaminated, the Engineer is not required to sample them before they are used.

**1. Bar Supports**

The following list of products may be used without sampling or pre-testing if the Engineer determines they are uncontaminated or undamaged and are the specific products identified on the governing QPL. Approved bar supports are listed in [QPL 19](#).

Otherwise, they shall be sampled and tested as outlined in the [Sampling, Testing, and Inspection Information](#).

Product	Qualified Products List	Standard Specification Section
Preformed, Hot Poured, and Elastomeric Polymer Joint Compounds	<a href="#">20</a>	<a href="#">833</a>
Joint Fillers	<a href="#">66</a>	<a href="#">833</a>
Epoxy Adhesives	<a href="#">15</a>	<a href="#">886</a>
Membrane Curing Compounds	<a href="#">16</a>	<a href="#">832</a>
Special Surface Coatings for Concrete Surfaces	<a href="#">17</a>	<a href="#">836</a>
Waterproofing Membrane Materials	<a href="#">22</a>	<a href="#">888</a>

No report on materials is necessary, but the Engineer will document the material (brand name, manufacturer, source, etc.) in the Project Diary or as required in [Section 106](#) of the Construction information.

**2. Paper, Mat Fabric, or Sheet Type Curing Materials**

The Engineer is not required to sample these materials if the material is a commercial grade adequately manufactured for its stated purpose.

If the material does not meet Specifications, the Engineer will submit to the [Office of Materials and Research](#) a 1 yd<sup>2</sup> (1 m<sup>2</sup>) sample of each type of material. Testing will be according to [Section 832](#) of the Specifications.

**3. Dampproofing or Waterproofing Material**

The Project Engineer will submit a 1 qt (1 L) sample of each material from each material source to the [Office of Materials and Research](#) before construction begins. Liquid dampproofing and waterproofing materials shall be tested and accepted as described in [Section 826](#) of the Specifications.

**4. Reinforcement Steel**

This item will be accepted as described in [Section 511](#) and [Section 853](#) of the Specifications.

**5. Deck Oil**

[QPL 23](#) lists approved deck oils.

If the deck oil is not on the QPL, the Engineer shall submit a 1 qt (1 L) sample of the completed deck oil, linseed oil, and mineral spirits to the [Office of Materials and Research](#). Testing will be according to [Section 870](#) of the Specifications.

**500.2.01 Delivery, Storage, and Handling**

General Provisions 101 through 150.

**500.3 Construction Requirements****500.3.01 Personnel**

General Provisions 101 through 150.

**500.3.02 Equipment**

General Provisions 101 through 150.

**500.3.03 Preparation**

General Provisions 101 through 150.

**500.3.04 Fabrication**

General Provisions 101 through 150.

**500.3.05 Construction**

General Provisions 101 through 150.

**500.3.06 Quality Acceptance****A. Concrete Test Cylinders**

The frequency of concrete test cylinder fabrication, slump, and entrained air determination shall be as specified on the Concrete Cylinder Testing Table.

The Engineer shall make and cure the test cylinders according to [GDT 35](#). Take each set of test cylinders from the same sample of concrete taken from one batch of concrete.

When the Contractor requests compressive strength tests to remove forms or open the structure to traffic, make and cure additional cylinders according to [GDT 35](#).

**Concrete Cylinder Testing Table**

Item-Title		Cylinder Fabrication Frequency	Slump and Air Determination and Frequency
441	Concrete Slope Paving, Concrete Sidewalks, Paved Ditches, Concrete Curb, Gutter Combination, Curb & Gutter, Header & Median, Velocity Dissipaters, Spillways, and Slope Drains	One set per each 100 cumulative cubic yards (765 cubic meters) or set per week, per plant if placement is less than 100 cubic yards (765 cubic meters) per week.	Air and slump test are required when cylinders are made and as judged necessary to insure adequate control.
500	Concrete Pipe Headwalls, CS Concrete and Concrete Subbase.	Acceptance of concrete for these items is based upon results of slump and air tests and the properly documented Form 319. No cylinders required.	Air and slump tests are performed as judged necessary to insure adequate control.
636	Highway Signs		
643	Fence		
668	Miscellaneous Drainage Structures (catch basins, drop inlets, manholes, junction boxes and drain inlets)		
680	Highway Lighting		
500	Concrete Structures	One set per each 50 cubic yards (38 cubic meters) or fraction thereof, of each class concrete placed daily for each structure, except for concrete used in bridge curb, bridge handrail or wall coping. Two concrete cylinders shall be fabricated for each cumulative 50 cubic yards (38 cubic yards) or fraction thereof, of concrete placed per	Air and slump tests are required when cylinders are made and as judged necessary to insure adequate controls. Additional tests are recommended on at least every third load on bridge deck placement.
433	Reinforced Concrete Approach Slabs		
638	Structural Support for Overhead Highway Signs		
626	Coping		

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Item-Title	Cylinder Fabrication Frequency	Slump and Air Determination and Frequency
	week in each structure. Cylinders shall not be fabricated at one structure to represent concrete placed in another structure.	
504 Twenty-four Hour Accelerated Strength Concrete	One set of four for each placement date.	Air and slump tests are required when cylinders are made and as judged necessary to insure adequate control.
621 Concrete Barrier	One set per each 75 cubic yards (57 cubic meters) or fraction thereof placed daily, except for concrete barrier placed with slip form equipment. Two cylinders shall be fabricated for each 150 cubic yards (115 cubic meters) or fraction thereof placed daily.	Air and slump tests are required when cylinders are made and as judged necessary to insure adequate control.

### 500.3.07 Contractor Warranty and Maintenance

General Provisions 101 through 150.

### 500.4 Measurement

General Provisions 101 through 150.

#### 500.4.01 Limits

General Provisions 101 through 150.

### 500.5 Payment

General Provisions 101 through 150.

#### 500.5.01 Adjustments

General Provisions 101 through 150.